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THE MODERN SOLDIER CAN NOT BE MADE IN A DAY

THE ARMY IS A LEARNED PROFESSION, WITH INTRICATE, CLEARLY DEFINED, AND DIFFICULT SPECIALTIES, AND MEN MUST BE CAREFULLY AND THOROUGHLY TRAINED.

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WASHINGTON
GOVERNMENT PRINTING OFFICE
1915

UA23
.B75

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FEB 3 1916

THE MODERN SOLDIER CAN NOT BE MADE IN A DAY.

By HENRY BRECKINRIDGE, *Assistant Secretary of War.*

Five years ago about this time I was sitting in the office of a prominent Baltimore attorney. I was talking army to him. He was an unusually intelligent man, conservative, fairly learned, at least in the law, and with a reasonable knowledge of affairs. In the course of the conversation he asked me—

Why should a man go into the Army? What is there in it to make it a life work? After he has learned to drill and shoot, his life is simply a matter of routine. Larger talents do not bring any larger financial returns. And, altogether, I can not see that the Army is any place for a man who wishes to make the most of his resources of intellect and character.

The attitude of this man is not an uncommon one among intelligent Americans. The European war has drawn the attention of the public mind to things military to an unwonted degree. But there remains on the part of many people a lack of appreciation of what the military service is, of what is required to make a soldier and an officer, and of the fact that the military profession, of a verity, is a learned profession. Despite the vivid demonstration of the last year, there still lingers the impression in some quarters that all you have to do to make a soldier is to put a uniform on his back, shoes on his feet, rifle in his hand, give him ammunition, a knapsack, and the untrained American patriot is prepared to cope with the best trained soldier in the world. The task yet remains to dispel completely the illusion that a sword in the hand, a strap on the shoulder, and the fire of patriotism in the eye of the American volunteer are all that is required to make an officer fit to lead the improvised soldier to victorious conflict with trained armies.

What is endeavored to be demonstrated in this article is that the Army is a learned profession; that to be a successful officer of the Army requires as high a development of the intellect and character as is needed for success in any other learned profession; that the Army is not only a learned profession, but that it is a learned profession with as many intricate, clearly defined, and difficult specialties as are to be found, for instance, in the great profession of medicine.

There are two great divisions of the military profession—first, technical, and, second, tactical and strategical.

I.—Technical.

As medicine has a surgeon, oculist, aurist, gynecologist, pediatrician, psychiatrist, and other specialists, so the Army has its surgeon, judge advocate, quartermaster, ordnance officer, engineer, and signal officers. The average officer is no more or less fit to perform without preliminary instruction the duties of an ordnance officer, for instance, than is an obstetrician fit to perform an operation for cataract.

ORDNANCE DEPARTMENT.

Where do the rifles, bayonets, pistols, scabbards, cartridges, packs, harness, field guns, and mammoth Coast Artillery cannon come from? Who makes them? Who designs them? The officers of ordnance. A small cartridge looks a simple thing. We speak glibly of great numbers of rifles. Smokeless powder and other high explosives we know to be essential, but we have very little appreciation of what it means to provide them. How many of us appreciate the intricate chemical and mechanical processes required in the manufacture of smokeless powder? How many of us realize that 33 complete chemical and mechanical operations have to be gone through with accurately, precisely, carefully, before white cotton, mixed with sulphuric and nitric acids, becomes smokeless powder? And after, with elaborate processes, the powder is made at the Picatinny Arsenal, it must travel from Dover, N. J., to the Frankford Arsenal, outside Philadelphia, there to be but an element in the 40 complete manufacturing and assembling operations that are required to make a rifle cartridge.

A rifle is a more or less simple-looking mechanism, but to make this rifle 1,223 separate manufacturing operations must be executed.

One round of 3-inch shrapnel means 355 operations; to make an automatic pistol, 614; and for the terrible little mitrailleuse or machine gun, 1,990. The lightest 3-inch field gun costs $1,400 and requires in the making a number of different operations, the enumeration of which would be exceedingly tiresome.

And through the different calibers we come to the 14-inch coast-defense gun made at Watervliet Arsenal at Albany, weighing when finished 138,000 pounds and costing $55,000 and wound about with 37,000 pounds of wire. The disappearing carriage for this mighty weapon that lifts it above the parapet to hurl its mighty missile and racking charge a half score of miles to sea—to attempt to describe its intricacies would but confuse my own and the reader's mind. One of these carriages involves as many as 3,000 separate parts.

It is the officer of the Ordnance Department that must conceive, plan, design, manufacture, issue, and repair all this category of

material which goes to make up the implements of an army. What must he know to perform these functions? What must be his training to guide with efficiency the labor of the 6,000 workmen in the six great establishments where the ordnance material of the Army is made?

A designer and constructor of ordnance must be a mechanical engineer capable of computing the stresses brought upon the parts of complicated structures by the control of masses set in motion by the action of immense forces which he must be able to determine. He must master the methods of arranging and proportioning the parts of the structures so that they may withstand the forces of which he shall have previously determined the magnitude, and he must be familiar with the processes of the constructive arts which are concerned with the fabrication of machines, in order that he may take full advantage of their possibilities and may not produce impracticable designs requiring the impossible. He must understand chemistry, which enters into the composition and action of explosives, his main source of supply of primary power, and the art of metallurgy, which supplies him with his usual material for utilizing and controlling power. He must be equipped with the knowledge of an electrical engineer, that he may deal with that power which is finding increasing application in the operation of ordnance constructions and plants for producing them. He must be familiar with the science of optics, in order that telescopic and other optical instruments for sights and fire-control instruments may be properly designed and inspected. And his knowledge of these subjects must include a specially sound mastery of principles, as he is generally without the aid of handbooks and practical treatises so useful in commercial work.

In addition to the material that is manufactured in the Government arsenals large quantities are purchased from private manufacturers. Procurement by manufacture requires expert knowledge of manufacturing processes, including machine operations, foundry work, forging, pattern making, leather working, woodworking, pressed steel construction, plating, wheel construction, brass drawing, manufacture of powder and high explosives, grinding of lenses, assembling and testing optical instruments, forging and testing armor-piercing projectiles, etc. It further necessitates expert knowledge of power plants, fuels, oils, machinery, raw materials, and electrical installations. In short, it requires all of the expert knowledge necessary for the economical operation of large manufacturing plants, and the greater part of it pertaining to manufacture of the most exacting type. Chemical testing and research work for powders and higher explosives, as well as analyses and

tests of oils, paints, etc., are carried on at the Picatinny Arsenal, and metallurgical, chemical, and physical tests and research work are carried on at the Watertown Arsenal in connection with the manufacture of iron and steel, physical tests of material for commercial purposes, and microscopical and physical tests for the department. This class of employment requires very exact scientific attainments of the officers in charge.

Experimental work in general, tests of powder and material, are conducted at the Sandy Hook Proving Ground. For this employment intimate knowledge of interior and exterior ballistics, action of powder and explosives, and manipulation of delicate electrical and other testing instruments are required.

So it is readily seen that though many a patriotic citizen, when the country is in danger, might rush forward to be an officer of ordnance, he would not be of very much use after he had rushed.

SIGNAL CORPS.

One of the greatest advances made in the art of war during recent years has to do with the service of information. The motor cycle, the swift automobile, the land military telegraph line, field telephone systems, field wireless telegraph outfits, and the aeroplane have revolutionized the system of communication and of obtaining information. The great service of information is specialized in by the Signal Corps, and the efficient handling of all the apparatus that pertains to this service can only be by highly trained and experienced individuals. In case of war a thousand patriots might rush forward for service in the aviation corps. By the time the war was over they might have obtained sufficient knowledge to make them useful.

ENGINEER CORPS.

The engineer is another essential military specialist. The swift building of a pontoon bridge over turbulent streams may be required to win a victory or save an army. Military engineering consists, broadly, of the application of engineering science for the accomplishment of military purposes. And military engineering, therefore, requires an extensive knowledge of military art and also of the art of the engineer. He builds all the harbor defenses. He must be an expert in field engineering in all its branches, including fortifications, the use of explosives, construction of bridges, roads, and field railroads, reconnoissance and survey, including field astronomy, photography, and lithography. He must have knowledge of electrical and mechanical engineering, which is required in the operation of searchlights, electrical mines, lighting plants, and power machinery for carrying out all sorts of field work.

It is very natural for the query to arise in one's mind as to why any good doctor would not make an efficient medical officer of the Army. There are many reasons. In the first place, the problem of administration in the Army Medical Corps presents features not dealt with in private practice. And the great field of military sanitation as applied in the military service by medical officers is a distinct specialty. It embraces the subjects taught in post-graduate courses in some of the most progressive medical schools under the caption of "Public Health and Preventive Medicine." It includes also those special measures which have been developed entirely within the military service for the care of troops in the field, where large bodies of men are brought together without the modern methods of waste disposal available in towns and cities. A few years ago it was considered impossible for troops to continue to camp on the same ground for a longer period than two weeks without camp diseases becoming epidemic. At the present time in the United States Army, even under unfavorable conditions of climate and terrain, troops remain on the same ground under canvas for indefinite periods with a continuously low sick list. The special knowledge necessary to inaugurate and maintain these conditions is of the highest importance to the health of the army and to its battle efficiency. Again, the recruitment, instruction, and control of the Hospital Corps and the Army Nurse Corps is a special field for the military surgeon.

The establishment of aid stations, dressing stations, hospitals, and other formations for the care of sick and wounded on the field of battle; the medical officer must understand where these formations should be established in order to obtain the best results and at the same time not interfere with the movement of ammunition trains, reserves, or other bodies of troops necessary to battle success. To enable him to perform these duties successfully and to obtain a reasonable degree of protection from fire for his wounded, a medical officer must have knowledge of the range and trajectory of projectiles; he must be able to read a map and to estimate therefrom the places most protected from rifle fire, from artillery fire; the most direct lines of aid to the front and for the evacuation of wounded to the rear; the slopes that are prohibitory for wheeled vehicles, the places where watercourses may be forded, etc. In short, the Medical Corps of the Army is the great conserving agency of a destructive organization. To wage war successfully, the greatest amount of destruction must be visited upon the armed forces of the enemy. For this end is required the utmost conserva-

tion of the health, energies, and life of the Army. And to this great end the highly trained and specialized Medical Corps is absolutely essential.

QUARTERMASTER CORPS.

The capacity for organization and administration required of officers in the Quartermaster Corps of the Army is at least equal to that required in the great supply departments of any of the combinations of capital and units of economic production in the world. Problems of paying, feeding, clothing, and transporting armies and their supplies are full of complexities and difficulties, the enumeration of which space does not permit. Nothing is more true than the oft-quoted and vigorous statement that an army marches on its belly. A single weak link in the chain of the supply system may lose a battle, and an uneducated and untrained quartermaster is as useless and defective as would be a novice in the control of the great power plants that have harnessed the Falls of Niagara.

JUDGE ADVOCATE.

It may seem a strange statement that the Army must have attorneys and counselors just as much as the United States Steel Corporation must have them. For instance, the present Judge Advocate General of the Army, upon the institution of American government in the Philippine Islands, completely organized the various departments of government on the civil side. Of his work, ex-President Taft, the president of the Philippine Commission which succeeded the military governor as the governing authority in the Philippine Islands, said that "Col. Crowder's activities were limited only by what would be the limitations of a civil government and legislature." Under his administration there were prepared customs regulations, coast trade regulations, and the municipal law of the Philippine Islands which intrusted the people of the provinces and municipalities with a great part of the management of their local affairs, thus preparing them for the exercise of self-government. He so amended the Spanish code of criminal procedure by a military order as to make it conform to our common law and constitutional principles. This order still governs criminal procedure in the Philippine Islands. He reorganized the courts of the Philippine Islands and was an associate justice on the civil side of the supreme court for the first year after its reorganization. During the intervention by the United States in Cuba, from 1906 to 1909, the present Judge Advocate General was acting secretary of state and justice. He was legal adviser to the provisional governor, president of the advisory commission, and in charge of the electoral administration. Laws regulating the registration of voters and the conduct of elections were framed.

In citing this individual record of service in the Army's law department I do it to show what may be the career of an Army Judge Advocate and what is required to enable him worthily to meet the demands of such a career.

II.

Let us now turn from the consideration of the great technical specialties that are so necessary to the efficiency of an army and consider why it is that the soldier who walks or rides and shoots and fights can lay claim to the respect that is due worthy members of a learned profession.

Why is it that any man who can tote a pack and carry a rifle can not be transformed immediately into an effective infantryman? Why is it that one who adds to these capabilities some knowledge of horsemanship can not in the twinkling of an eye, by the donning of a uniform, be a worthy cavalryman, or, with a little training in pointing a gun, be a pretty good artillerist? And in the higher fields of leadership, why can't any good American organizer, with sound judgment and courage, attain military success in larger operations?

THE QUEEN OF BATTLES.

Dashing Cavalry may effect a brilliant raid in the rear of the enemy and in a hundred ways vindicate and justify its existence and necessity. Many a critical situation may be saved by the steadfastness and power of the Field Artillery. But the foundation of the Army structure is the plodding, trudging, digging, sweating, burden-bearing infantryman. When the lay mind has been persuaded that the technical specialists can not be improvised and that even the cavalryman and artilleryman must have some modicum of training before efficiency is attained, extremely persistent is the tendency still to think that the very foundation of an army can be summoned into being as if by magic. Many present-day Americans have no experience with horses. And the individual's conviction that one who is a horseman is therefore superior to himself in that particular line is what makes it fairly easy to convince the lay mind of the necessity of adequately trained Cavalry. The same thing applies to the Field Artillery or any branch of the service that has to do with implements more or less mysterious to the ordinary individual through lack of his acquaintance therewith. But everybody knows he can walk and carry a pack on his back at least a little ways and point a rifle and pull a trigger. And thus there seems to have been in the minds of our people, from the first until the present, an abiding illusion that an infantryman can be improvised. But he can't.

A very simple thing it seems to care for one's feet. But as a matter of fact the care of the feet in marching is an art in itself, and if unlearned the ignorance of it will destroy a command. And marching. An improvised army would be marched to death by trained troops before any physical contact need be gained. In maneuvering for position untrained and unhardened troops would wilt and drop by the wayside in exhaustion while trained armies were playing hide and seek with them all over the terrain. The mere factor of physical condition and not general physical condition, but the particular and special physical fitness trained to perform the peculiar task and meet the special exigencies of service as an infantryman in the field, can only be come at by the most rigorous training.

Anyone can charge across an open field. But on that field, seeming from a short distance as flat as the palm of one's hand, the trained infantryman, with his knowledge of the use of ground for cover, is about half as likely to die in such a critical undertaking as the unknowing novice.

The modern rifle is an efficient weapon. Its trajectory is flat up to a considerable range. That is, the bullet in passing through its course over a given distance goes on a level in a plane, putting everything in its way in danger, and does not have to describe a curve going up and coming down in order to reach a fairly distant mark. The trained soldier knows this and knows that the slightest depression in the landscape will give him more or less safety from an enemy rifleman. For instance, a greenhorn, in seeking cover, would naturally choose the slope of a hill away from the enemy, when a trained infantryman would know that he would be in greater safety on the other side of that hill where he would be closer to the enemy, but within that range where the enemy's bullets would travel in a flat trajectory and give him a chance to take advantage of the safety afforded by the slightest depression in the ground rather than remain behind that hill to suffer the long-range plunging fire of the enemy.

How little does the ordinary citizen realize the difficulty of becoming a sharpshooter or expert in the use of the military rifle? Most of us have a vague impression that accurate shooting means merely straight pointing. The ordinary layman has little conception, for instance, of the influence of a slight wind on the course of a rifle bullet at a thousand yards' range. For accurate long-distance shooting this influence of wind upon the bullet must be accurately estimated and allowed for by a graduated instrument on the rifle called a wind gauge, and success or failure in sharpshooting and sniping may well depend upon the accuracy or inaccuracy with

which the problem of windage is solved. There is little understanding by most of us of the effect of light conditions—that with one condition of light there is a tendency to aim too high and with another condition of light that there is a tendency to aim too low, and that all this must be taken into consideration and accurately estimated and provided for in all fine rifle shooting.

Space does not afford to do more than suggest the thousand details that must be mastered by the proficient officer of Infantry. Problems of organization and problems of equipment have to be worked out by the most painstaking and scientific observation and deduction. For instance, only large experience and accurate estimate has established the general principle that the load of the infantryman must not exceed one-third the weight of the individual soldier if the best efficiency is to be obtained. One knows vaguely that soldiers are organized into companies, battalions, regiments, brigades, divisions, and armies, but why is each unit organized as to number and material as laid down in tables of organization and drill book? The most profound study of experience has taught that certain organizations are best adapted for the handling of given masses of troops. For instance, the company contains the greatest number of men in which the relation of the personal influence of the individual leader or his subordinates can be maintained. And the battalion has worked out to be the normal fighting unit that can best be handled in actual combat by one man's directions when in the fighting are involved large numbers. And the regiment has been found convenient for the purpose of obtaining a proper supervision of the three battalions. The brigade is organized similarly as a convenient organization in which to combine three regiments, while the division, combined as it is of all arms, Infantry, Cavalry, Artillery and auxiliary troops, comprises that mass of men most suited for transportation on a single road and for action as a unit in great operations where large armies are involved.

Never has the stress of war called forth the moral qualities which present war conditions require of the Infantry: To face destruction by the enemy's Artillery when he is 5 or 6 miles from a point where he himself can inflict injury in return, suffer casualties in advancing over great stretches of ground without firing a shot, to face the thunderbolts of large caliber guns and howitzers, to endure the rain of death of shrapnel and high explosives, to meet the withering hail of the hell-spitting mitrailleuse, to face the steel-jacketed sheet of rifle fire, even to suffer death at the hands of one's own supporting Artillery, cut the wire entanglement, mount the parapet, to give or receive the death thrust of the bayonet's cold steel. This is what modern warfare requires of the infantryman. To meet the test

he must be faithfully and arduously trained. And to give him this training there must be developed the learned and successful officer who comprehends his task.

CAVALRY.

The cavalryman must be reasonably proficient in all that pertains to the lore of the infantryman, but of course in a lesser degree. In addition he must be a master of the horse. He must know how best to train man and horse, for the trained man increases the power of the horse to render service, and the trained horse makes infinitely less demand upon the physical strength of the rider than does the untrained horse. Mobility is one of the decisive factors in war. Napoleon said that "The power of an army, like the quantity of movement in mechanics. is measured by the product of its mass by its rate of motion." Nothing requires more care, knowledge, and practical experience than is needed to develop proficiency in conserving the energy and power of the horse. The Cavalry officer must be an expert in this, as also he must be an expert in the use of the pistol and the sword. Despite the condition of the western European battle front, with its trenches and intricate field fortifications, highly trained and powerful bodies of Cavalry are as essential to the successful conduct of war as ever.

FIELD ARTILLERY.

Fine appreciation of what Field Artillery means in modern war was shown by the colored applicant for enlistment in one of the so-called immune regiments recruited in a Southern State during the War with Spain. A colored recruiting sergeant discussing warfare in general and in particular waxed fervent in his exposition, finally ending an animated account of the excitement of war by telling the applicant that in the armies of the world there were even guns that shot a thousand pounds of steel from 10 to 15 miles. "Great Lawd!" said the discouraged patriot, "none of that for me. A man would run all day and get shot at sundown."

This conversation accurately exhibited the present conditions of war as far as the effects of artillery fire are concerned. Until 1896, when the French developed the long recoil rapid-fire field gun, the artillery always occupied direct laying positions—in other words, positions from which the targets could be seen from the guns. After the adoption of the long recoil system the general rule was and is to occupy masked or indirect laying positions; in other words, positions from which the targets remain invisible to the gunners at artillery ranges hitherto unheard of in war. But now all normal combats are carried on between gunners that can not possibly see one another. The officer who is observing the fire of his battery

may be a couple of miles in front of his guns, tucked away in an observation trench, perched in a tree or in a haystack, connected with his battery by land telephone. Or the observer may be hovering over the enemy objective a half mile or more in the air, bringing back or signaling back information as to the effect of the fire. To meet these changed conditions a precise system of range finding by various angle-measuring instruments and intricate optical devices has been wrought out and mastered.

The responsibility for accurate shooting by the Artillery is greater than ever before. It is impossible for the Infantry to advance without the fullest support from the Artillery. It is necessary that this support be continued until one's own troops are very near to the enemy, so that the enemy fire may be beaten down. But to render this support at the last moment without slaughtering one's own soldiers in the excitement and heat of battle is a great problem. Nothing will destroy the morale of Infantry more quickly than lack of confidence in its supporting Artillery, with the consequent fear that in an assault on an enemy position not only will there be danger from foe, but equal danger from friend. It is easily seen that the most thorough and arduous training is necessary to attain the required degree of perfection. The Field Artillery officer must be an expert in the erection of field telephones and buzzers, in map making, scouting, and panoramic sketching. He must be a horse master, an expert in the conservation of human and animal energy, a good mathematician, a field astronomer, and possess a character reliable for coolness, steadfastness, and endurance.

COAST ARTILLERY.

The great Coast Artillery service really demonstrates itself to the ordinary mind. Respect is compelled for the men who handle the giant guns of our harbor defenses, operate the intricate machinery necessary for their manipulation, and execute the complicated calculations that have to be made in estimating ranges. A gun that shoots a projectile weighing a ton 20,000 yards and develops a muzzle energy of approximately 126,000 foot-tons speaks for itself. These are the guns that make it possible for the fleet to seek the enemy wherever it may be advisable, leaving strategic harbors and important cities to the protection of the Coast Artillery as far as the danger of attack from a hostile fleet is concerned. This is the service that offers an asylum to the fleet in case it needs such asylum in the face of a superior enemy or after having been roughly handled. It must not be assumed that the Coast Artillery protects the coasts. We have about 5,000 miles of coast line, about 300 miles of which are under the potential protection

of coast-defense guns. But the Coast Artillery does perform the absolutely essential service of giving freedom to the fleet by the protection of cities and harbors. The guns vary in caliber from 3-inch to 16-inch, their respective projectiles weighing from 15 pounds to 2,400 pounds. The Coast Artillery officer must be an expert in the management of power plants and electrical devices. He must be familiar with the operation of searchlights, telephone systems, angle-measuring instruments, observing instruments, plotting boards, range-correction boards, deflection boards, speaking tubes, anemometers, psychrometers, and other minor appliances. The elements of fire control are mounted at various parts of the fortifications, and the care and operation of the system involve a fundamental knowledge of all the apparatus and its application to the service of the guns. And it must be remembered that the normal target for the Coast Artillery is a swiftly moving vessel, and the problem resolves itself often into the seemingly impossible task of hitting with a solid shot a vessel 6 or 7 miles away, moving at the rate of from 20 to 30 miles an hour. The problem seems more difficult of solution than shooting ducks with a rifle rather than a shotgun. Weather conditions must be taken into consideration as well as the motion of the target. As conditions vary from day to day they affect materially the flight of the projectile. The density of the atmosphere as affecting the resistance offered to the projectile in flight; the velocity of the wind, which operates in like manner; and the height of the tide, as affecting the relative elevations of the gun and vessel, all must be taken into account. Obviously, all observations and calculations must be completed in a very brief period of time, and the most careful training is required to bring about that coordination of all the elements necessary to permit one of these huge guns to be fired accurately once every minute.

If it has in any wise been demonstrated that those who are engaged in the training and administration of the units and branches that go to make up an army merit the respect that is due to worthy members of a learned profession, then it is obvious that general officers, exercising the higher commands in which it is necessary to bring together and coordinate and in war direct to a common end all the elements that make up an army, must be men of the highest capacity and best judgment.

Every profession has not only its technicalities and requirements for efficiency, but it also has its ethics. Whatever else may be said of the Army as a learned profession, there is no doubt of the fact that the ethics of the profession can not be surpassed by those of any human profession. Every worthy officer realizes that shoddy work, slovenliness, lack of industry, and proficiency may and will

mean not the loss of property but at the very least the destruction of human life. And without affectation and without cant, there underlie the work of the true soldier the knowledge and belief that as long as human nature remains as it is, the very honor and life of his nation some day is bound to depend on the thoroughness and fidelity with which he executes his trust. The code of ethics of the military profession may be summed up in the two words "Honor" and "Fidelity." And in the Army of the United States the code is lived up to with a strictness that is full of reassurance that any test will be met in accordance with the best traditions of soldiers.

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